

App. No. 10/615675
Office Action Dated September 15, 2004
Amd. Dated March 15, 2005

REMARKS

Reconsideration is respectfully requested in view of the above amendments and following remarks. Claims 1, 4, 9, 12 and 15-17 have been amended editorially. Claim 1 has also been amended to recite "two or more light emitting devices", as supported at least by Figs. 1 and 4. No new matter has been added. Claims 1-18 are pending.

The drawings are objected. The specification has been amended to correspond with Fig. 4. No new matter has been added. Withdrawal of the objection is respectfully requested.

The specification is objected to for various informalities in addition to the lack of subject headings. The specification has been amended. No new matter has been added.

Claim 1 has been objected to for the use of "etc.". Claim 1 has been amended to delete --etc.--. No new matter has been added. Withdrawal of the objection to claim 1 is respectfully requested.

Claim 2 is objected to for various informalities. The Office Action alleges "it seems unreasonable to add multiple power supply units when the same function could be met by a single source with multiple switches for current flow to said groups of light emitting devices [Please note International Publication Number WO 02/080136 - Figure 5 and Summary], especially when the applicant is taking into consideration a smaller package for electronics." Applicant respectfully points out that the use of separate power supply units for multiple light emitting devices leads to improved control of the wavelength spectrum. The solution in WO 02/02010136 is not as flexible, as the different coloured LEDS cannot be individually operated at the same time, which is described at page 5, lines 33-36 of the specification. For at least the above comments, applicant respectfully requests the objection to claim 2 be withdrawn.

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Claim 9 is objected for various informalities, in particular for the use of preferably. Claim 9 has been amended to delete --preferably inside the cavity--. New claim 19 has been added to depend from claim 9 and to recite "inside the cavity". No new matter has been added. Withdrawal of the objection to claim 9 is respectfully requested.

Claims 11 and 12 are objected to for various informalities. The Office Action alleges "it is unnecessary, bar malfunction, that a controller would need a light sensor for the defined function above. It is already assumed and inherent that the controller would provide the light characteristics or desired optical output required to efficiently display an image." Applicant respectfully submits the control electronics unit controls the light emitting devices to emit light using a set of initial control values. The use of a light sensor provides the actual characteristics of the emitted light in the cavity, and thus the actual wavelength characteristics of the light source, and based on this, the control electronics can change the control values and thus change the output characteristics of the light source. The reason for being able to do this among other things is that the characteristics of the light emitting diodes may change over time, and the use of the light sensor can compensate for this. For at least the reasons discussed above, applicant respectfully requests the objection to claim 11 and 12 be withdrawn.

Claim 12 is further objected to for improper dependency. Claim 12 has been amended to depend from claim 11. No new matter has been added. Withdrawal of the objection to claim 12 is respectfully requested.

Claim 17 is objected to for improper dependency. Claim 17 has been amended to depend from claim 16. No new matter has been added. Withdrawal of this objection to claim 17 is respectfully requested.

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Claim 17 is further objected, in particular "cooling system" lack antecedent basis. Claim 17 has been amended to depend from claim 16, claim 16 has been amended to depend from claim 15 and claim 15 has been amended to depend from claim 14. No new matter has been added. Withdrawal of this objection to claim 17 is respectfully requested.

Applicant appreciates the Examiner's indication that acknowledgement has been made for foreign priority under 35 U.S.C. 119, item 12 of the Office Action Summary. Applicant respectfully requests box 1 indicating certified copies of the priority document have been received be marked and respectfully requests an updated copy indicating such. A copy of the priority document was submitted on December 6, 2003 along with a response to the Missing Parts.

Applicant respectfully requests acknowledgement of the Information Disclosure Statement filed on October 7, 2003, a copy of the Form 1449 is hereby enclosed. A copy of the return postcard is also enclosed, indicating receipt by the Patent Office.

Claim rejections - 35 U.S.C. § 103

Claims 1-10, 13-15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arnold (US 6,220,725) in view of Parker et al. (US 6,224,216).

Applicant respectfully traverses the rejection.

Claim 1 is directed to a light source device for illuminating microdisplay devices. The device requires two or more light emitting devices mounted on or in wall(s) of the housing which do not directly face the exit aperture, for emitting light into the cavity. The exit aperture is adapted to the shape and size of the microdisplay selected from the group consisting of DMD, LCOS, LDC and GLV. The light source device further

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comprises electrical power supply(s) and control electronic unit(s) for controlling the light emitting device(s).

Arnold teaches a light source using an integrating cavity utilizing Light Emitting Diodes as light emitters. The light source device taught by Arnold is not suitable for illuminating a microdisplay device. Arnold emphasizes that the aperture size should be relatively large, with the ratio of the exit port area to the total internal area being larger than 4%. With regard to the small size of microdisplay devices, it is very important that the light has small etendue, to ensure that all the light is transferred to the display device. To achieve small etendue is very important and a much discussed matter within this technical field. A reduction of etendue is achieved by means of the combination of the features recited in claim 1. Arnold fails to render the features recited in claim 1 obvious.

Parker uses an optical integrator for providing a uniform light beam and optical guides/fibers to lead the light toward the integrator/microdisplay. Parker fails to teach or suggest replacing the integrator with a cavity and arranging light emitting devices directly in the walls of the integrating unit. The solution presented by Parker will cause losses and aberration in the light beam and thus be less suited for the purposes which demand high quality of the light beam with respect to brightness and uniformity. The device as required by claim 1 provides high brightness and good uniformity of the output light. This is accomplished by means of the features recited in claim 1. Parker fails to render the features recited in claim 1 obvious.

Therefore, neither Arnold nor Parker, alone or in combination, renders claim 1 obvious. Withdrawal of the rejection is respectfully requested.

Claims 2-10, 13-15 and 18 depend from claim 1. For at least the reasons discussed above for claim 1, withdrawal of the rejection is respectfully requested.

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Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arnold (US 6,220,725) in view of Parker et al. (US 6,224,216) as applied to claim 1, and further in view of Kanayama (US 4,897,639). Applicant respectfully traverses the rejection. Claims 11 and 12 depend from claim 1. For at least the reasons discussed above for claim 1, withdrawal of the rejection is respectfully requested. Kanayama fails to remedy the deficiencies of Arnold and Parker.

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arnold (US 6,220,725) in view of Parker et al. (US 6,224,216) as applied to claim 1, and further in view of Skinner (US 6,447,146). Applicant respectfully traverses the rejection. Claims 16 and 17 depend from claim 1. For at least the reasons discussed above for claim 1, withdrawal of the rejection is respectfully requested. Skinner fails the remedy the deficiencies of Arnold and Parker.

In view of the above, favorable reconsideration in the form of a notice of allowance is requested. Any questions or concerns regarding this communication can be directed to the undersigned attorney, John J. Gresens, Reg. No. 33,112, at (612)371.5265.

Respectfully submitted,


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By


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